NOAA WIND PROFILER MAINTENANCE NOTE 1 (for Electronics Technicians)
Engineering Division
W/OS0321:FLP

Wind Profiler Site Configuration Audit

GENERAL

The Profiler Program Office (PPO) asked us to do a configuration audit of each NOAA wind profiler site. The PPO will use the audit results to check the configuration of each profiler and to help them maintain the network according to NWS policies. You will check the physical configuration and functional operation of the profiler site during the audit.

The physical configuration audit involves inspecting items to get serial numbers, check physical condition, and count quantities of installed units or on-site stock levels. The letter "I" (for visual inspection) in the "M" column of the Profiler Site Configuration Audit Checklist identifies items that are part of the physical audit.

The functional configuration audit involves testing items at the profiler site that the PCC cannot test or check remotely. The letter "T" (for test) in the "M" column of the Profiler Site Configuration Audit Checklist identifies items that are part of the functional audit.

It will take about 3 work hours to complete the audit, plus travel.

The following attachments will help you do the audit.

    Profiler Site Configuration Audit Checklist (Forms 1, 2 and 3)

    Functional Configuration Audit Test Procedure

    Diagram of the PA fan assemblies (figure 1)

    Diagram of 40 VDC power supplies (figure 2)

    Diagram of power supply #1 and #2 drawers in the equipment cabinet (figures 3 and 4)

In addition, you will need the following materials:

    A 10-inch adjustable wrench for the PSOS mast procedure.

    Inspection (dental) mirrors to read the serial numbers on some components without removing them.

A 3-5 foot stool to support the PSOS mast. You can use the stool in the equipment shelter.

The 3.5-inch diskette containing the electronic copy of the Site Configuration Audit Checklist. The PPO will send this diskette separately from this maintenance note.

The addressed postage-paid return mailer the PCC sent with the 3.5-inch diskette.

You must remove some cabinet panels to expose parts, get LRU serial numbers, and inspect the condition of some items during the audit. You also may have to remove some LRUs from their cabinets to retrieve the needed information.

If you have questions or need assistance, contact:

Profiler Control Center (PCC) (303) 497-6033 or
Jody Lynn   (303) 497-3095.

PROCEDURE

1. Call the PCC at (303) 497-6033 and tell them you are there to do the site audit.

2. Record the requested information on the Profiler Site Configuration Audit Checklist (Forms 1, 2 and 3). Follow each step on the checklist to make sure that you get all needed information. Use the attached Functional Configuration Audit Test Procedure to do the functional tests.

    When possible, get both the original manufacturer and Unisys serial numbers from the name plate or serial number tag on each part. Unisys serial number tags are about 2 X 2 inches and grey/silver in color with black letters. Some parts may not have Unisys serial numbers. No PSOS assembly will have Unisys serial numbers.

    When required, place the count of installed or existing units at a site in the "CNT" field of the checklist.

    Use the "Verify Condition" field of the checklist to record comments, problems, or discrepancies. These fields will advise the PPO of anything not adequately covered elsewhere on the audit checklist.

3. Use the Portable Maintenance Test set (PMT) to transfer the audit information to the 3.5-inch diskette supplied by the PCC after completing the checklist.

   To record the audit information on the Site Configuration Audit Checklist diskette, put the 3.5-inch diskette in the PMT A: drive and turn the PMT on. The diskette is a boot disk and should automatically start the checklist form. Type the five letter NWS name of the site (for example, AZCN5 for Aztec, NM).
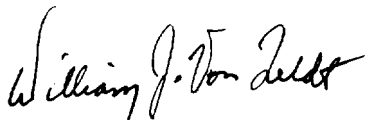
4. When you complete the audit, reset all alarms, disconnect the PMT from the system status monitor, remove jumper cables from all access alarms, and contact the PCC when you leave the site.

5. Use the addressed postage-paid return mailer and send the completed Profiler Site Configuration Audit Checklist (diskette and the paper copy) to the PCC.

Target date for completing the audit is 30 days after receipt of the 3.5-inch diskette from the PPO.

EFFECT ON OTHER INSTRUCTIONS

Reporting procedures - Call the PCC to close out a failure. Give the PCC personnel the serial numbers from the failed LRU, replacement LRU, and station identifier. When possible, get both the original manufacturer and Unisys serial numbers. If the PCC is not staffed when you close the failure, leave the information on the recorder.

EHB-9, Section 2.5 - Insert the attached index pages in Section 2.5 and file maintenance note 1.

J. Michael St. Clair
Chief, Engineering Division

Attachments

FUNCTIONAL CONFIGURATION AUDIT TEST PROCEDURE

(FORM 1)

TRANSMITTER CABINET

RF Driver assemblies
Power Amplifier (PA) modules (16)

This test measures the current level (CL) and output power (OP) for each PA module.

1. Make all measurements in the EAST beam HIGH mode.

2. The "East" LED on the front panel of the Beam Steering Unit (BSU) indicates EAST HIGH mode operation. The "East" LED will light as the system starts the east high mode. At this point, you have about 1 minute to make measurements on the PA modules. Wait for the BSU to cycle back to the EAST HIGH mode if you cannot check all the modules during one cycle.

3. Place the amp local monitor in "local" mode.

4. Use the up/down arrow buttons on the front panel of the amp local monitor and select a module. The amp local monitor will display that module's current and voltage levels. A fault condition LED will light if the selected module does not function.

5. Record the readings for current, voltage, and any fault condition LED that lights when selecting a module.

6. Repeat this procedure for each PA module.

7. Return the amp local monitor to "remote" mode after checking and recording all 16 modules.

PA Fan Assemblies

This test checks how many PA fans work. See figure 1 for the location of the PA fan assemblies in the transmitter cabinet.

1. Check the amp local monitor front panel for any fan fault LEDs.

2. Remove the side panel of the transmitter cabinet.

3. Visually check each fan to see if it is turning.

4.   Carefully place one finger on the flat spot on top of the fan assembly. Check that the blade is turning under its own power and not by the draft from other fans.

5.   Record any fault indications and the location of any failed fan modules on the checklist. Use the supplied diagram of the PA fan assembly as a reference.

6.   Replace the transmitter cabinet side panel.

EQUIPMENT CABINET

Status Monitor Assembly

This procedure tests the status monitor assembly over-temperature shutdown feature.

1.   Disconnect the temperature probe located on the top right hand corner of the beam steering unit cabinet.

2.   The "inside temperature" display on the status monitor assembly will now read "1" in the most significant digit position.

NOTE

The outside temperature must be above 60 degrees F (15 degrees C) or the environmental control units will not turn on. If the outside temperature is below 60 degrees F disconnect the outside temperature probe from J10 on the status monitor assembly. This will simulate high outside temperature.

3.   Three events will happen if all systems in the profiler shelter function correctly:

        a.   Both air conditioner units will turn on;
        b.   The exhaust fan will come on;
        c.   The main breaker will trip (shut off).

4.   Reconnect the temperature probe(s).

5.   Reset the main breaker in the power distribution box on the shelter wall opposite the transmitter or PA cabinet.

6.   Record the test results on the checklist.

(FORM 2)

Visually inspect the items listed and record the results on the checklist.

(FORM 3)

PSOS MAST

Use this procedure to lower and raise the PSOS mast so you can get the LRU
serial numbers.

Lowering Mast

1. Remove the lightning ground conductor from the bonding plate at
    the base of the mast.

2. Determine which direction to fold the mast. Try to lower the mast
    into the wind if possible.

3. Clear a space 5 feet wide by at least 28 feet long, extending out
    from the mast foundation in the direction you will lower the mast.

4. Put the shelter stool about 20 feet from the mast foundation.
    Place the stool so the mast will lie on it when lowered.

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CAUTION
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Although the mast is counterbalanced, it may gain momentum as you lower
it. Lower and raise the mast slowly to maintain control.

5. Kneel in front of the lower mast with your body resting against it
    and press your body against the other saddle bar.

6. Loosen the saddle bar opposite the direction you intend to fold
    the mast.

7. With one side bolt still attached, swing the saddle bar up and to
    the side, out of the way of the lower mast.

8. Pull the lower mast out from between the uprights and pull it
    upward. Do this slowly, and take care to maintain control.

9. Move to the opposite side of the mast as it pivots past a
    45-degree angle.

10.   Support the mast over your head at arm's length.

11.   Carefully continue to lower the mast until the upper section rests on the 3-5 foot support.

12.   Record the LRU serial numbers on Form 3.

Raising Mast

1.   Check that the stop saddle bar is securely in place and that the hinge pin nut is loose.

2.   Check that the locking saddle bar is out of the way of the lower mast. Position the saddle bar so you can secure it after putting the lower mast between the uprights.

3.   Raise the top of the mast and slowly walk toward the mast foundation. Continue to raise the mast as you progress.

4.   When you reach the tabernacle, move around to the falling side of the mast and SLOWLY BUT FIRMLY push the lower mast down and into place between the tabernacle uprights and against the stop saddle bar.

5.   Crouch in front of the lower mast (opposite the stop saddle bar).

6.   To prevent the lower mast from pivoting out from between the uprights, install the second saddle bar (the locking saddle bar) opposite the first saddle bar and secure to lock the mast.

7.   Install the lightning ground conductor in the bonding plate at the base of the mast.

8.   Close and secure the J-box cover (if removed).

9.   Close and secure the upper cover on the closed upright of the tabernacle.

DOOR AND ANTENNA ACCESS ALARMS (LOCKS)

This test checks that the shelter access alarms function properly.

Shelter Doors

        Front door

                1.   Open the profiler shelter front door.

2. Use the PMT and log onto the profiler data processor.

3. Check the fault log for a "shelter access alarm."

4. Check above the door to make sure the sensor has not been bypassed with a jumper.

5. Record the test results on the checklist.

Rear Door

1. Open the shelter rear door.

NOTE

Opening the shelter rear door (also known as the antenna field door) will cause an entry in the PMT's fault log and interrupt the RF power to the antenna.

2. Use the PMT to log onto the profiler data processor.

3. Check the fault log for an access alarm.

4. Push the "System Pwr Out" button on the amp local monitor. The meter to the left of this button should show no meter deflection. No meter deflection shows that the system successfully disabled the RF power.

5. Close the shelter rear door.

6. Clear the access alarms using the "Reset Status Monitor" option of the main menu of the PMT. You may need to reboot the radar to get it to transmit again.

7. Restore the RF input.

8. Record the test results on the checklist.

Antenna Field Access Gate

1.   Open the antenna field access gate.

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Opening the antenna field access gate will cause an entry in the PMT fault log. The gate alarm will interrupt the RF power sent from the shelter to the antenna.

2.   Use the PMT to log onto the profiler data processor.

3.   Check the fault log for an access alarm.

4.   Check the RF input LED on the Amp Local Monitor inside the shelter. If the LED turns red, the system successfully disabled the RF power.

5.   Close the antenna field access gate.

6.   Clear the access alarms using the "Reset Status Monitor" option of the main menu of the PMT. You may need to reboot the radar to get it to transmit again.

7.   Record the test results on the checklist.

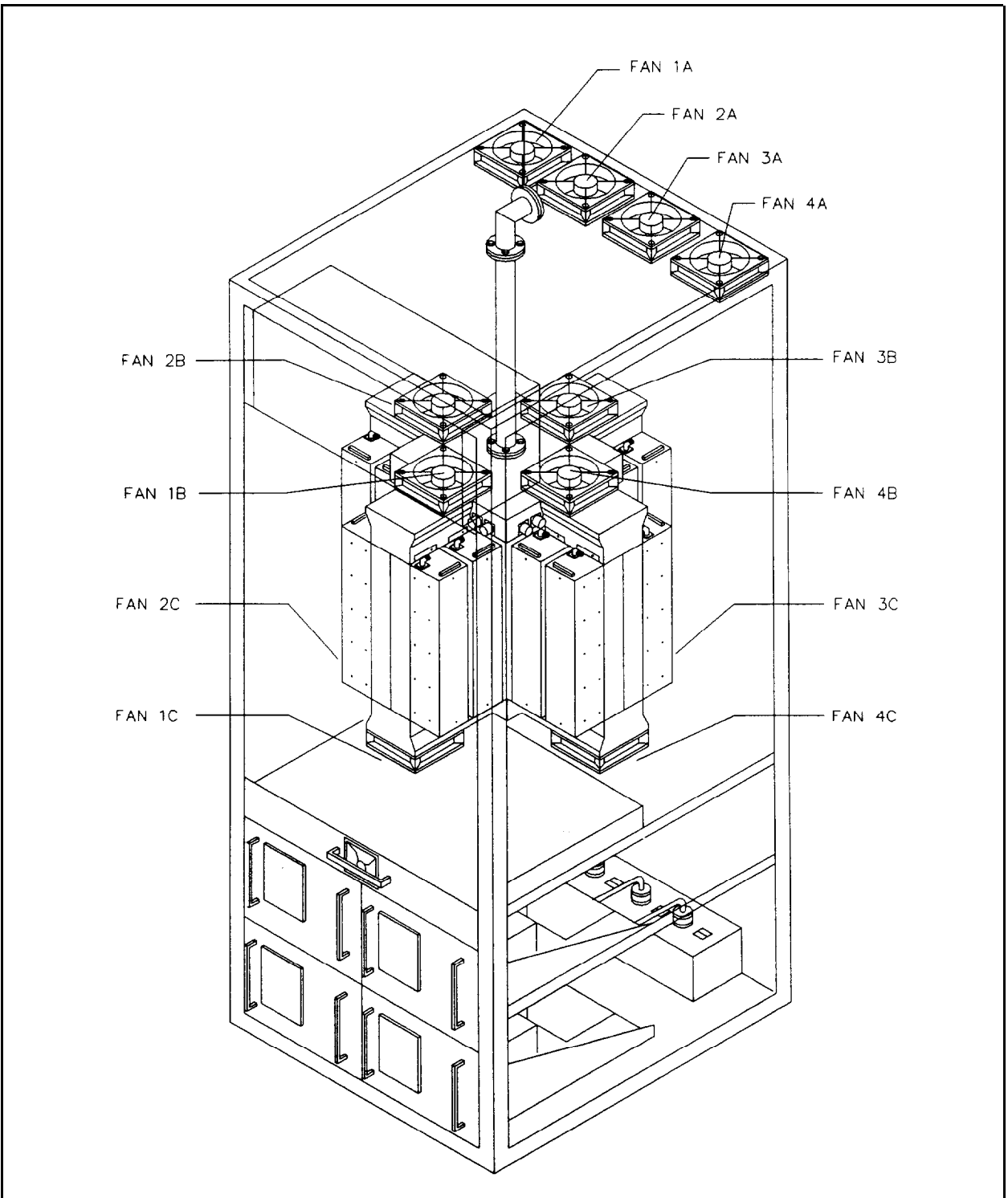This completes the audit of the wind profiler site.

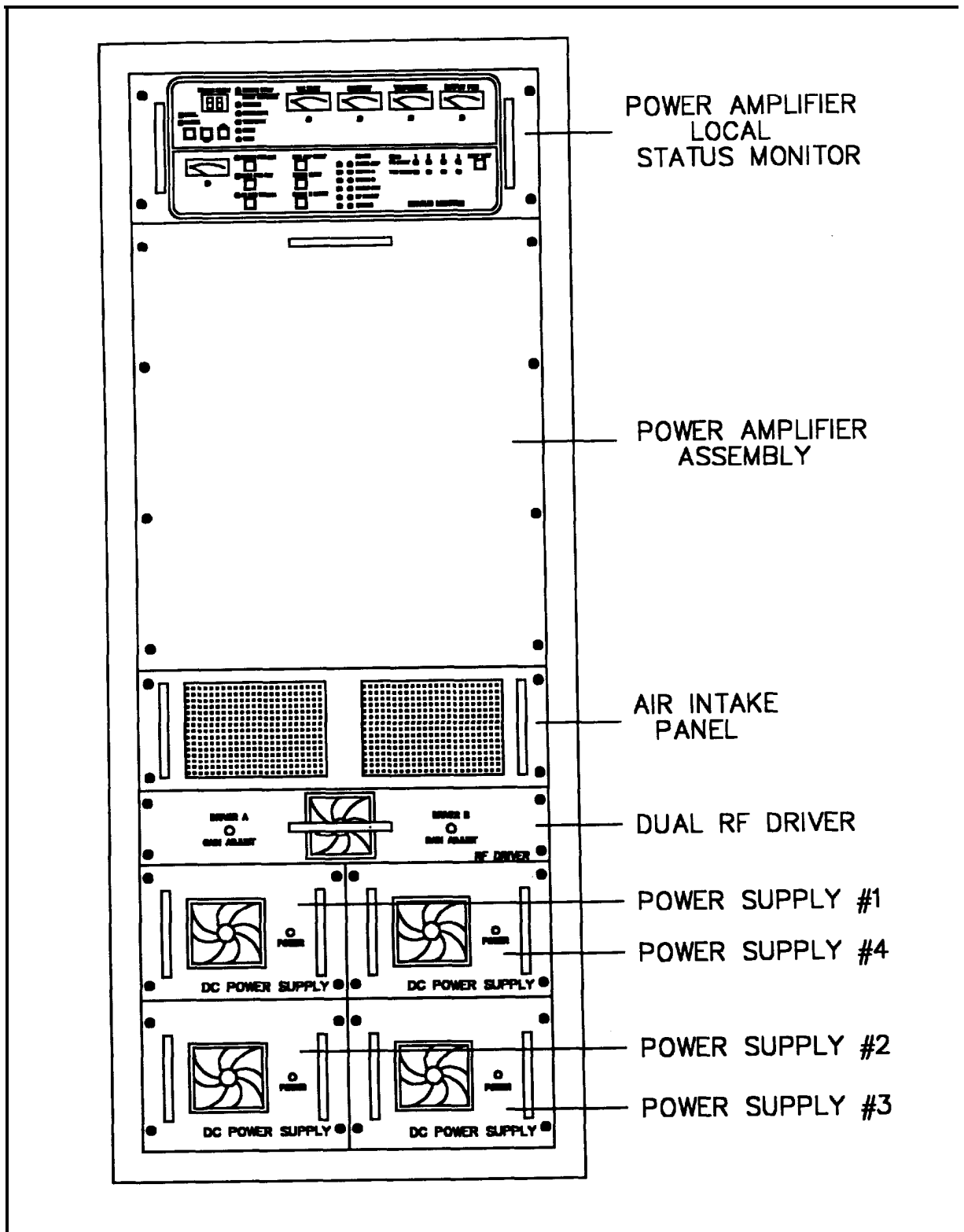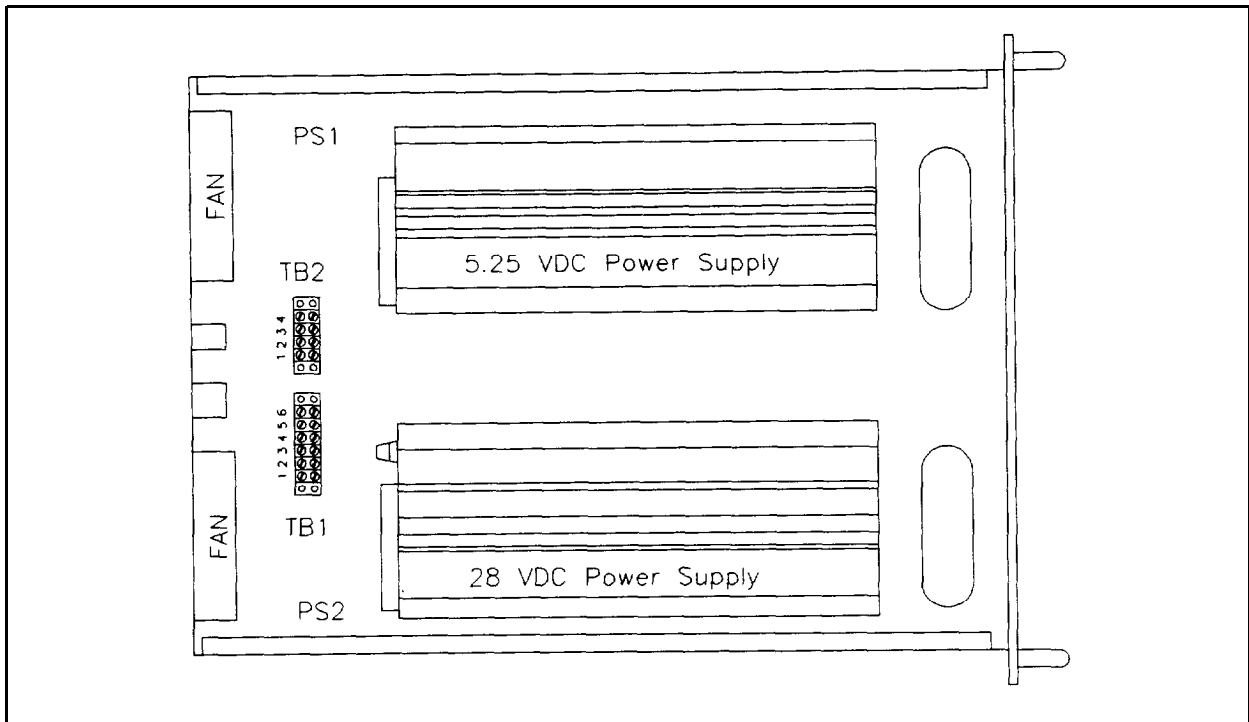Figure 1   Location of PA Fan Assemblies

Figure 2   40 VDC Power Supplies - Front View

Figure 3 Power Supply #1 Drawer - Top View
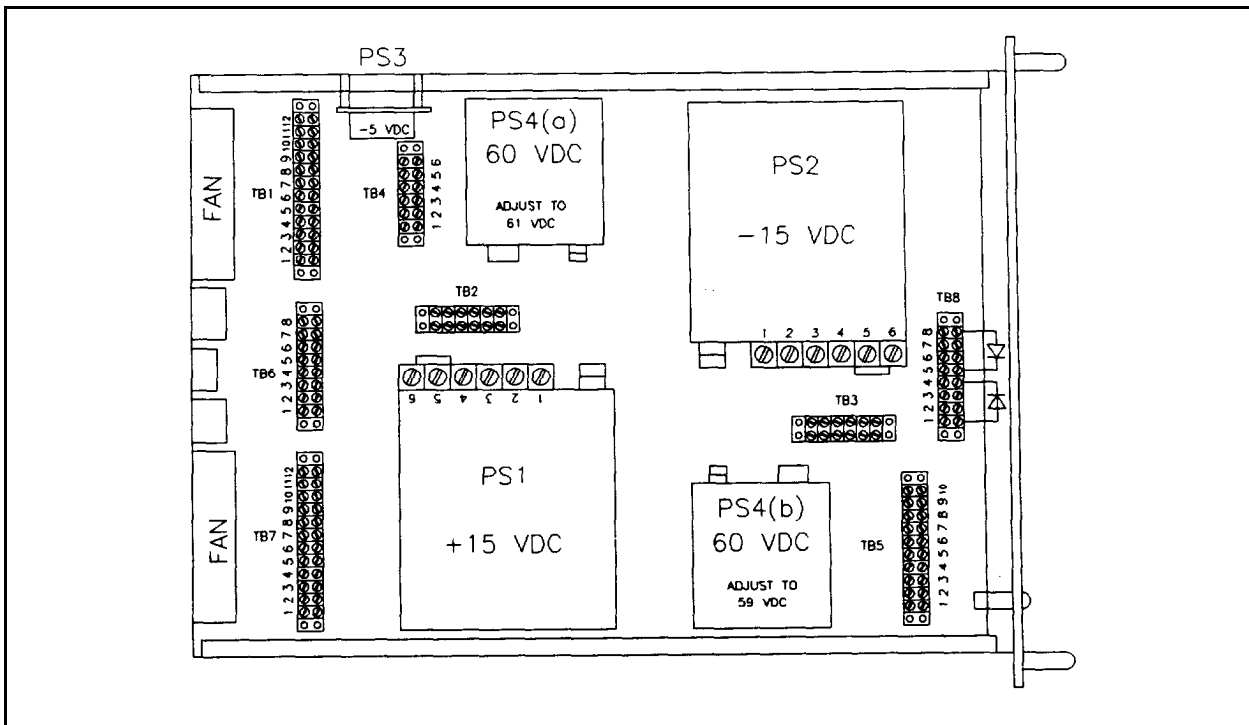
Figure 4   Power Supply #2 Drawer - Top View

1.   Press "Tab" or "Enter" key to move to next field.   Press "Shift" + "Tab" to move to previous field.
         "Ctrl" + "Left arrow" to shift form to left.
     Enter: Enter information in inverse video or colored fields.
3.   Leave form to save data.
4:   Press "Ctrl" + ("Page Down" or "Page Up") keys to move between forms.
     Enter the number of components in the count (Cnt) field.
6   Press "F7" to display test procedures.

Enter today's date: (DD-MM-YYYY HH:MM)   __-__-__   __:__   Site Identifier _____

Component Name	Unisys Serial Number	Manufacturer Serial Number	Cnt	M	Verify Condition

TRANSMITTER CABINET
RF driver assembly — — I ———————
Power amp (PA) modules (16)

Measure the current level (CL) and output power (OP) for each power amplifier module. Press "F7" for procedures.

	CL	OP	Unisys Serial Number	Manufacturer Serial Number	M	Verify Condition
1.	—	—			T	——————
2.	—	—	———	———	T	——————
3.	—	—	———	———	T	——————
4.	—	—	———	———	T	——————
5.	—	—	———	———	T	——————
6.	—	—	———	———	T	——————
7.	—	—	———	———	T	——————
8.	—	—	———	———	T	——————
9.	—	—	———	———	T	——————
10.	—	—	———	———	T	——————
11.	—	—	———	———	T	——————
12.	—	—	———	———	T	——————
13.	—	—	———	———	T	——————
14.	—	—	———	———	T	——————
15.	—	—	———	———	T	——————
16.	—	—	———	———	T	——————

Component Name	Unisys Serial Number	Manufacturer Serial Number	Cnt	M	Verify Condition
PA Combiner	_____	_____	__	I	_____
Power Amplifier Local Monitor	_____	_____	__	I	_____
PA fan assemblies (12)					
(See figure 1)					
Test how many of the PA fans work	Press "F7" for procedure.				
Number of working PA fans			__	T	_____
40 VDC Power Supplies (4)					
See figure 2)					
No: 2	_____		__	I	_____
No. 3	_____		__	I	_____
No. 4	_____		__	I	_____
BSU CABINET					
Transmitter feed cable (1)			__	I	_____
Coaxial circulator			__	I	_____
Directional coupler assembly	_____	_____	__	I	_____
5-way power divider			__	I	_____
BSU power feed cables (5)			__	I	_____
BSU switch assembly	_____		__	I	_____
BSU phase delay cables (5)			__	I	_____
BSU extension cables (10)			__	I	_____
Antenna feed cables (10)			__	I	_____
Torroidial cores on antenna cables (10)			__	I	_____
Reflected power sensor	_____		__	I	_____
Limiter	_____	_____	__	I	_____
T/R switch	_____	_____	__	I	_____
Receiver assembly	_____	_____	__	I	_____

Component Name	Unisys Serial Number	Manufacturer Serial Number	Cnt	M	Verify Condition
EQUIPMENT CABINET					
RF generator assembly					
Forward power sensor	————	————	——	I	————
LOHO & COHO diode detectors (2)	————	————	——	I	————
Signal processor assembly			——	I	
Data processor assembly	————	————	——	I	————
(Serial # on back of unit)	————	————	——	I	————
Status monitor assembly	————		——	I	————
Status monitor shutdown test.					
Press "F1" for instructions.					
Enter results in the count field.					
Outside air temperature (deg C)			——	I	————
Both air conditioners come on (yes/no)			——	T	————
Outside exhaust fan comes on (yes/no)			——	T	————
breaker trips (yes/no)			——	T	————
Power Supply #1 Assembly	————	————	——	I	————
(See figure 3)					
5 VDC power supply (PS1)	————	————	——	I	————
28 VDC power supply (PS2)	————	————	——	I	————
Power Supply #2 Assembly					
(See figure 4)					
-5 VDC power supply (PS3)	————	————	——	I	————
15 VDC power supplies (2)					
-15 VDC (PS1)	————	————	——	I	————
+15 VDC (PS2)	————	————	——	I	————
60 VDC power supplies (2)					
(PS4a)	————	————	——	I	————
(PS4b)	————	————	——	I	————

Component Name	Unisys Serial Number	Manufacturer Serial Number	Cnt	M	Verify Condition
OTHER INTERIOR LRUs					
Air conditioner units (2)					
Labeled at by-pass switch					
Unit 1			___	I	_____
Unit 2			___	I	_____
Fan motor			___	I	_____
Fan auto control unit (1)			___	I	_____
Fan air intake unit (1)			___	I	_____
PMT printer (1)	_____	_____	___	I	_____
PMT boot diskette	_____	_____	___	I	_____
(enter version number in CNT column)			___		
GOES ELECTRONICS ASSEMBLY	_____	_____	___	I	_____
UPS	_____	_____	___	I	_____
Transmitter	_____	_____	___	I	_____
MCM	_____	_____	___	I	_____
Interior thermocouple (1)			___	I	_____
SITE PROPERTY NUMBER					
Number on main breaker box	_____	_____	___	I	_____
D.O.C. document number	_____	_____	___	I	_____
MODIFICATIONS TO COMMUNICATIONS EQUIPMENT					
(Enter yes or no in the CNT column)					
IBS replaced with a null modem cable			___	I	_____
Modem connected to phone line			___	I	_____
Dedicated line modem			___	I	_____
(Homer/Vandenberg only)					

END OF FORM 1   Press "Ctrl" + "Page Down Key" to continue to the next form

Name	Cnt	M	Condition
NON-EXPENDABLE SUPPLIES			
50 ohm load (1)	___	I	_____
Type N adapter (1)	___	I	_____
BNC-SMA adapter (1)	___	I	_____
RS-232 break out box (1)	___	I	_____
RS-232 male female adapter cable (1)	___	I	_____
AC power line monitor (1)	___	I	_____
Thermometer (1)	___	I	_____
Stapler (1)	___	I	_____
Telephone (1)	___	I	_____
Knee pads (2)	___	I	_____
Key box (1)	___	I	_____
Scissors (1)	___	I	_____
Trash can (1)	___	I	_____
Snake bite kit (1)	___	I	_____
Stool (about 33 inches) (1)	___	I	_____
3-hole paper punch (1)	___	I	_____
Slotted head screw driver (1)	___	I	_____
Phillips head screwdriver (1)	___	I	_____
Heater (1)	___	I	_____
Fire extinguisher by front door (1)	___	I	_____
Need refill (Yes/No)	___	I	_____
Fire extinguisher by antenna door (1)	___	I	_____
Need refill (Yes/No)	___	I	_____
Smoke alarms in ceiling (2)	___	I	_____
Heat sensors in ceiling (1)	___	I	_____

Name	Cnt	M	Condition
EXPENDABLE SUPPLIES (# = Number of items) (% = Percent of container)			
PMT print cartridges (#)		I	
Spare 3.5-inch floppy diskettes (#)	—	I	
Spare paper rolls for power line monitor (#)	—	I	
PMT paper (% of box left)	—	I	
Trash bags (#)	—	I	
Duct tape (% of 1/2" roll left)	—	I	
Scotch tape (% of roll left)	—	I	
Kimwipes (% of box left)	—	I	
Windex (% of bottle left)	—	I	
100W flood lamp (spare)	—	I	
60W light bulb (spare)	—	I	
1/2" filter material for power amplifier cabinet	—		
and cap filters (sq ft)		I	
1/4" filter material for air conditioner units (sq ft)	—	I	
Replacement filter for fan intake air vent	—	I	
SITE DOCUMENTS (Enter yes or no in the CNT column)			
LRU replacement guide		I	
Site log book	—	I	
How much of the site log book is unused (%)	—	I	
Site information document	—	I	
AC power line monitor user manual	—	I	
Telephone book	—	I	
Test log	—	I	
Configuration log	—	I	
Unisys manual	—	I	
PMT manual (Zenith)	—	I	
PMT printer manual	—	I	
PMT users guide (Unisys)	—	I	
Sky board manual	—	I	
DOS manual	—	I	
Okidata manual	—	I	
GTE HW installation guide	—	I	
List all other documents in the Condition field	—	I	

END OF FORM 2. Press "Ctrl" + "Page Down Key" to continue to the next form

Component Name	NDBC Serial Number	Manufacturer Serial Number	Cnt	M	Verify Condition
EXTERNAL GOES EQUIPMENT					
GOES antenna			—	I	_____
Outside thermocouple			—	I	_____
PSOS EQUIPMENT					
(Press "F7" for procedures)					
Tipping bucket/rain gauge (1)	_____	_____	—	I	_____
Anemometer (2)					
A. Closest to shelter	_____	_____	—	I	_____
B. Farthest from shelter	_____	_____	—	I	_____
Humidity sensor (1)	_____	_____	—	I	_____
Pressure sensor (PLTC2 only) (1)	_____	_____	—	I	_____
Air temperature sensor (1)	_____	_____	—	I	_____
Mast			—	T	_____
"J" box			—	I	_____
VIP controller assembly (shelter)	_____	_____	—	I	_____

LOCKS
Enter either number of parts, yes, no, or N/A for component count in CNT column.

Is main service disconnect locked?			—	I	_____
Did shelter front door access alarm work?			—	T	_____
Did shelter back door access alarm work?			—	T	_____
Did antenna field access alarm work?			—	T	_____
Does profiler antenna fence door lock?			—	T	_____
Does GTE antenna fence extension door lock?			—	T	_____
Does the shelter key unlock the antenna fence lock?			—	T	_____
Does the shelter key unlock the GTE fence lock?			—	T	_____

Component Name	Cnt	M	Verify Condition

MISCELLANEOUS
High RF caution signs on fence? ___ I _____
Clutter Fence installed? ___ I _____
Are shelter front door steps in good condition? ___ I _____
Are shelter back door steps in good condition? ___ I _____
Is there an exterior shelter key? Where is it? ___ I _____
Any keys needed to access the site beside the shelter key? ___ I _____
    Where are they? ___ I _____
Any site access problems? ___ I _____
Are weeds a problem under antenna fence? ___ I _____
Are weeds a problem along site fence? ___ I _____
Are holes for cables under shelter sealed? ___ I _____

INTERIOR GROUNDING AND SURGE PROTECTORS
GOES surge protector installed? ___ I _____
Telephone surge protector installed? ___ I _____
Is 4-wire grounded AC power system installed? ___ I _____
Count the Leviton (model 2120MD) surge protectors in
the main panel add-on box.
    Surge protectors in use (2) ___ I _____
    Spare surge protectors (2) ___ I _____
Count the RS-232 surge protectors on data processor (2-3) ___ I _____
Count the 40A/250VAC solid state relays (3) ___ I _____
Count the 110 VAC type 1 voltage suppressors (hot to neutral) (2) ___ I _____
Count the 220 VAC type 2 voltage suppressor (hot to hot) (1) ___ I _____

Component Name	Cnt	M	Verify Condition

MODIFICATIONS TO SHELTER ENVIRONMENTAL EQUIPMENT
Count the air conditioner relay heat sinks installed (2)   ___   I   _____
Count the A/C hard-start kits installed (2)   ___   I   _____
Count the A/C 30 A breakers (2)   ___   I   _____
Solid state relay (10A/180VAC) main breaker panel?   ___   I   _____

EXTERIOR GROUNDING AND SURGE PROTECTION
Ground wire connected to the service box and ground rod?   ___   I   _____
Neutral power wire connected to the ground rod?   ___   I   _____
Type of main service disconnect? (1 = breaker bar, 2 = fuse)   ___   I   _____
Square D surge protector installed correctly?   ___   I   _____
Ground wires connected to PSOS mast and base?   ___   I   _____

ANTENNA CONDITION
Describe the condition of the antenna support structure.   ___   I   _____
Describe the condition of the antenna ground plane.   ___   I   _____
Describe the condition of the antenna lower sub-array.   ___   I   _____
Describe the condition of the antenna upper sub-array.   ___   I   _____
Describe the condition of the antenna feed cables.   ___   I   _____
Any additional information?   ___   I   _____

THIS COMPLETES THE SITE AUDIT.   Press "ESC" key to save data and exit.